

OKLAHOMA
AGRICULTURAL AND MECHANICAL COLLEGE
AGRICULTURAL EXPERIMENT STATION
STILLWATER, OKLAHOMA

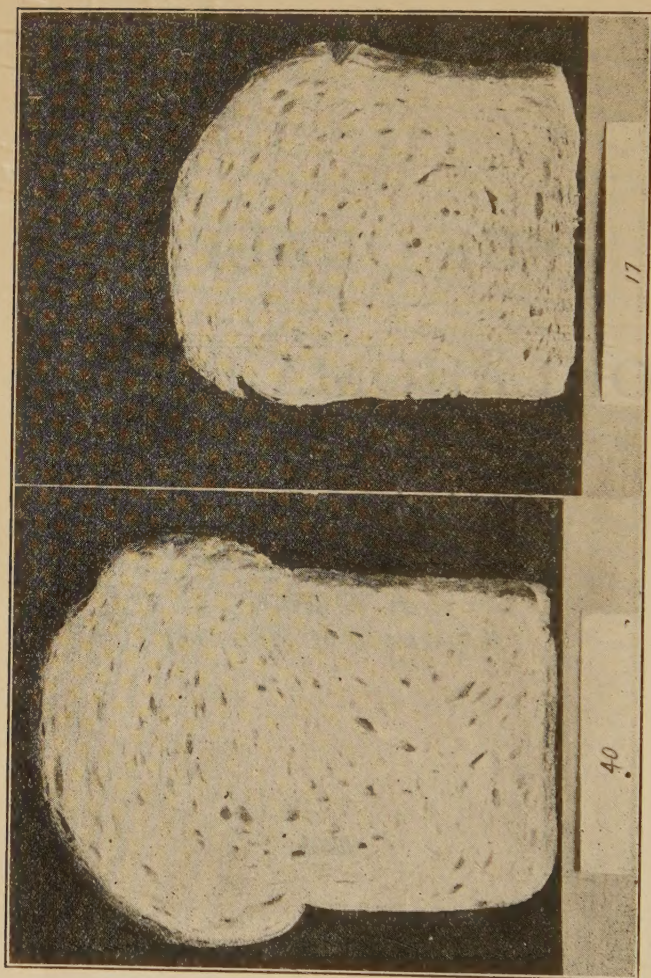
THE QUALITY
of
OKLAHOMA FLOUR

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There Is a Difference In Flours

The QUALITY OF OKLAHOMA FLOUR

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Wheat is one of Oklahoma's most important cereal crops. The wheat section of the state is what might be termed the southern extremity of the hard winter wheat area of the Great Plains. The climatic conditions are conducive to the growing of a high quality of wheat for milling purposes. There are several flour mills located in various parts of the state, especially in the hard winter wheat area, and consequently many brands of Oklahoma flours as well as flours manufactured by mills in the neighboring states are found on the markets in Oklahoma. That a test might be made to determine the relative value of the Oklahoma flours as compared with the brands from neighboring states, a baking test was made of samples of the different brands collected from various parts of Oklahoma. They were secured from retail merchants in most cases. In a few instances the brands of flour desired were not found in the retail stores visited consequently they were secured direct from the mill.

In order that an unbiased baking test could be made, each sample (which consisted of approximately six pounds of flour) was divided into two equal parts, one-half of each sample being sent to the Minnesota State Milling and Baking laboratories, Minneapolis, Minnesota, and the other half to the El Reno Mill and Elevator Company's laboratory, El Reno, Oklahoma. The samples of flour in each case were sent in plain unmarked bags. Each sample was given a number. The brands of flour corresponding to each number were kept in the agronomy office at the A. and M. College, Stillwater, Oklahoma, consequently the cereal chemists making the test had no information as to the brand of flour being used in each bake.

Sixty-six samples of flour were baked at Minneapolis. Some of these samples are duplicates of brands collected in different parts of the state. In the following table, the results are given for the Oklahoma and the out-of-state flours separately.

One baking test was made by H. F. Vaupel, cereal chemist of the El Reno Mill and Elevator Company. The second baking test was conducted by the State Testing Mill, Minneapolis, Minnesota.

A list of the different brands of flour used in this comparison was suggested by Mr. Frank Foltz, secretary of the Oklahoma Millers' Association, Oklahoma City.

*Oklahoma Agricultural Experiment Station***Oklahoma Flours**

Sample No.	Fermentation Time (min.)	Absorption Percent	Loaf Volume c. c.	Color Score	Texture Score
.2	285	69.2	2350	104	102
3	265	64.3	2430	100	100
11	265	62.9	2110	105	100
12	260	63.2	2280	100	99
20	255	63.4	2190	100	102
22	270	62.3	2070	104	100
23	265	64.3	2430	103	105
30	255	65.7	2490	103	100
31	275	64.0	2310	103	102
39	250	64.3	2070	100	100
40	275	64.3	2650	105	100
42	265	64.3	2380	105	99
43	280	61.4	2350	100	99
44	275	62.0	2250	100	96
45	245	63.4	2130	101	100
46	240	61.4	2240	101	101
51	275	64.3	2150	104	103
54	260	63.7	2370	105	103
55	255	64.3	2400	104	105
56	255	64.3	2390	105	105
57	250	64.3	2310	104	103
63	280	64.3	2020	103	99
66	245	65.7	2250	103	102
67	245	65.7	2000	100	100
Average	262.01	64.04	2275.86	102.58	101.04

Out-of-State Flours

1	285	69.2	2350	104	102
4	275	64.3	2020	105	105
5	290	65.7	2210	102	100
6	275	62.6	2160	105	105
8	265	65.7	2060	99	100
9	280	59.2	2200	105	101
10	275	58.0	2100	103	101
13	270	58.0	2190	101	100
14	255	64.3	2060	104	100
15	270	62.9	2500	105	98
16	260	62.9	2380	105	104
21	240	64.3	2330	103	100
24	245	61.4	2290	101	99
26	255	65.7	2200	104	101
32	285	61.4	2260	105	104
33	295	63.2	2380	104	102
34	275	64.3	2230	101	102
35	285	64.3	2360	105	102
36	265	65.7	2200	101	100
37	275	64.3	2260	103	99
38	270	63.4	2240	103	100
41	270	64.3	2350	101	99
47	260	62.0	2280	100	96
48	255	60.3	2020	99	94
49	250	63.7	2200	100	100
50	280	61.4	2130	103	104
52	270	61.4	2250	104	103
53	265	63.4	2110	104	104
58	260	65.7	2300	105	105
59	260	64.3	2340	104	103
60	280	65.7	2070	102	101
61	275	64.3	2080	102	101
62	295	64.3	2000	102	100
64	275	62.9	2230	105	101
65	285	64.3	2370	105	99
Average	270.57	63.10	2220.28	102.97	101

The averages in the above table show that the Oklahoma flours were more active, had a higher absorption and a larger volume of loaf than the out-of-state flours from neighboring states. (The absorption reported in per cent is based on the flour as weighed for the baking test. No corrections are applied to compensate for variations in the moisture content of the flour). There was little difference in the color and texture of the loaves of the out-

of-state brands of flour and Oklahoma flours when compared by the Minneapolis results.

The El Reno baking tests were made on nine high grade Oklahoma flours and seven high grade out-of-state flours. Other brands of flour not strictly classed as first grade were not used in the El Reno test. The following are the El Reno results:

El Reno Test, Baking Test, First Grade

Oklahoma Flours

Number	Absorption	Time Ferment Minutes	Loaf Volume	Baking Qualities	Color Crumb	Texture Loaf
23	62	125	2280	Very good	100	100
42	65	125	2210	Very good	100	101
46	64	125	2210	Very good	99	100
54	66	130	2390	Excellent	98	101
66	65½	125	2310	Excellent	99	100
69	63	130	2400	Excellent	100	100
73	59	120	2350	Excellent	102	102
75	61	130	2200	Very good	99	100
68	63	120	2220	Very good	100	101
Average	63.16	125.55	2285.55		99.66	100.55

Out-of-State Flours

24	61	130	1930	Fair	96	96
37	61	125	1990	Good	99	99
38	60	125	2120	Good	101	101
65	64	125	2310	Excellent	99	99
71	62	130	2230	Very good	99	100
72	61	130	2300	Very good	99	100
76	62	130	2250	Very good	98	99
Average	61.57	127.85	2161.42		98.71	99.14

The El Reno test coincides with the Minneapolis test. The Oklahoma flours show up to advantage in practically every phase of the baking test, especially in absorption, loaf volume, and "baking qualities," as shown in the above table. In color, crumb and texture of loaf, there is but little difference. Because the El Reno test was not made on all the samples baked at Minneapolis, the following table shows the results of the Minneapolis test on such samples as were used in both laboratories:

Minneapolis Test

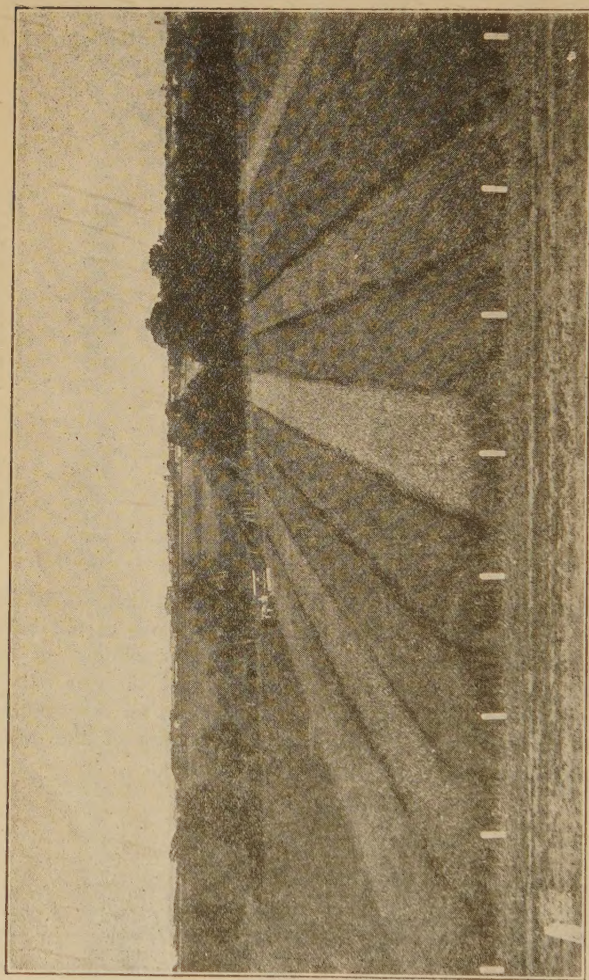
Baking Test, First Grade

Oklahoma Flours

Number	Absorption	Time Ferment Minutes	Loaf Volume	Color Crumb	Texture Loaf
23	64.3	265	2430	103	105
42	64.3	265	2380	105	99
46	61.4	240	2240	101	101
54	63.7	260	2370	105	103
66	65.7	245	2250	103	102

Out-of-State Flours

Average	63.88	255	2334	103.4	102
24	61.4	245	2290	101	99
37	64.3	275	2260	103	99
38	63.4	270	2240	103	100
65	64.3	285	2370	105	99
Average	63.35	268.75	2290	103	99.25



Variety Test of Wheat on the Experiment Station Farm

In this table the results are much the same as in the others, each factor in the test is slightly more favorable to the Oklahoma flours. The results further confirm the El Reno test.

In the following table is shown the chemical analysis made of the flours at El Reno:

First grade analysis, Calculated 13.5% moisture basis, El Reno test.

Oklahoma Flours

Number	Moisture	Ash	Protein	Color-Dress	
				Dry	Wet
23	10.29	0.38	11.80	100	99
42	12.01	0.37	11.50	100	99
46	12.24	0.40	12.40	99	99
54	11.39	0.39	13.10	98	97
66	11.56	0.38	12.10	98	98
69	10.60	0.36	11.60	101	101
73	11.62	0.41	10.70	102	101
75	11.14	0.37	11.40	99	98
Average	11.35	0.3825	11.825	99.6	99.0

Out-of-State Flours

Number	Moisture	Ash	Protein	Dry	Wet
24	10.51	0.40	10.90	97	96
37	11.12	0.40	10.50	100	100
38	10.90	0.36	10.70	102	101
65	11.22	0.37	11.20	100	100
71	11.80	0.39	11.30	98	98
72	11.55	0.40	11.70	99	98
76	11.95	0.39	11.80	98	97
Average	11.29	0.3871	11.157	99.1	98.5

This analysis shows that in a chemical test, the Oklahoma flours are at least the equal of the out-of-state flours. The ash content is slightly lower which is desirable in that the high grade flours are always lower in ash content. The protein is higher and the color both dry and wet is slightly better.

From this comparison it is observed from both the Minneapolis and El Reno results that Oklahoma mills are putting on the market flour that compares in every respect the equal if not superior to the out-of-state brands.

